

## BEST AVAILABLE COPY




[PubMed](#)
[Nucleotide](#)
[Protein](#)
[Genome](#)
[Structure](#)
[PMC](#)
[Taxonomy](#)
[OMIM](#)
[Books](#)

Search  for

[Limits](#)
[Preview/Index](#)
[History](#)
[Clipboard](#)
[Details](#)

Range: from  to  ☐ Reverse complemented strand Features: ☐ SNP

☐ CDD ☒ MGC ☐ HPRD ☐ STS

☐ 1: [X52066](#). Reports *Clostridium botul...*[gi:40381]

[Links](#)

LOCUS CBBOTAG 4292 bp DNA linear BCT 12-SEP-1993  
 DEFINITION *Clostridium botulinum* botA gene for type A neurotoxin.  
 ACCESSION X52066 X52088  
 VERSION X52066.1 GI:40381  
 KEYWORDS botA gene; neurotoxin; secreted protein.  
 SOURCE *Clostridium botulinum*  
 ORGANISM *Clostridium botulinum*  
 Bacteria; Firmicutes; Clostridia; Clostridiales; Clostridiaceae;  
 Clostridium.  
 REFERENCE 1 (bases 1 to 4292)  
 AUTHORS Thompson,D.E., Brehm,J.K., Oultram,J.D., Swinfield,T.J.,  
 Shone,C.C., Atkinson,T., Melling,J. and Minton,N.P.  
 TITLE The complete amino acid sequence of the *Clostridium botulinum* type  
 A neurotoxin, deduced by nucleotide sequence analysis of the  
 encoding gene  
 JOURNAL Eur. J. Biochem. 189 (1), 73-81 (1990)  
 PUBMED [2185020](#)  
 REFERENCE 2 (bases 1 to 4292)  
 AUTHORS Minton,N.P.  
 TITLE Direct Submission  
 JOURNAL Submitted (08-JAN-1990) Minton N.P., PHLS Centre for Applied  
 Microbiology & Research, Molecular Genetics Group, Division of  
 Biotechnology, Porton Down, Salisbury SP4 0JG Wiltshire, U K  
 FEATURES Location/Qualifiers  
 source 1..4292  
 /organism="Clostridium botulinum"  
 /mol\_type="genomic DNA"  
 /strain="sub sp. type A, NCTC2916"  
 /db\_xref="taxon:1491"  
 misc\_feature 16..64  
 /note="dyad symmetry"  
 promoter 19..24  
 /note=""-35 region"  
 promoter 41..46  
 /note=""-10 region"  
 RBS 63..68  
 /note="ribosome binding site"  
 CDS 77..3967  
 /note="unnamed protein product; type A neurotoxin (AA  
 1-1296)"  
 /codon\_start=1  
 /transl\_table=11  
 /protein\_id="CAA36289.1"  
 /db\_xref="GI:40382"

## BEST AVAILABLE COPY

/db\_xref="GOA:P10845"  
/db\_xref="UniProt/Swiss-Prot:P10845"  
/translation="MQFVNKQFNKDPVNGVDIAYIKIPNVGQMOPVKAFKIHNKIIVW  
IPERDTFTNPEEGDLNPPPEAKQVPVSYDYDSTYLSTDNEKDNLYLKGVTKLFERIYSTD  
LGRMLLTSIVRGIPFWGGSTIDTELKVIDTNCINVIQPDGSYRSEELNLVIGPSADI  
IQFECKSFGHEVLNLTRNGYGSTQYIRFSPDFTFGFEESLEVDTNPLLGAQKFDPA  
VTLAHELIIHAGHRLYGIAINPNRVFKVNTNAYYEMSGLEVSFEELRTFGGHDAKFIDS  
LQENEFRLYYNKFKDIASTLNKAKSIVGTTASLQYMKNVFKEKYLLSEDTSGKFSVD  
KLKFDKLYKMLTEIYTEDNFVKFFKVLNRKTYLNFDKAVFKINIVPKVNYTIYDGFNL  
RNTNLAANFNGQNTTEINNMNFTKLKNFTGLFEFYKLLCVRGIITSKTKSLDKGYNKAL  
NDLCIKVNNWDLFFSPSEDNFTNDLNKGEEITSNTNIEAAEENISLDLIQYYLTFNF  
DNEPENISIEENLSSDIIGQLELMPNIERFPNGKKYELDKYTMFHYLRAQEFEGHKSRI  
ALTNSVNEALLNPSRVYTFSSDYVKKVNKATEAAMFLGWVEQLVYDFTDETSEVSTT  
DKIADITIIIPYIGPALNIGNMMLYKDDFVGALIFSGAVILLEFIPEIAIPVLGTFALV  
SYIANKVLTVQTIIDNLSKRNEKWDEVYKIVTNWLAKVNTQIDLRKKMKEALENQA  
EATKAIINYQYNQYTEEEKNNINFNIDDLSSKLNESINKAMININKFLNQCSVSYLMN  
SMIPYGVKRLEDFDASLKDALLKYIYDNRGTLIGQVDRLLKDKVNNLTSTDIPIFQLSKY  
VDNQRLSTFTTEYIKNIINTSILNLRYESNHLIDLSRYASKINIGSKVNFDPIDKNQI  
QLFNLESSKIEVILKNAIVNSMYENFSTSFWIRIPKYFNSISLNNEYTIINCMENNS  
GWKVS LN YGEI IWT LQDTQEIKQRVVF KY SQMINISDYINRWIFVTITNNRLNNSKIY  
INGRLIDQKPI SNLGN I HASNNIMFKLDGCRDTHRYIWI KYFNLGDKELNEKEIKDLY  
DNQSN SGI LKDFWGDY LQYDKPYMLNLYDPNKYVDVNNVNGIRGMYLKGPRGSVMTT  
NIYLNSSLYRGTKFI IKKYASGNKDNIVRNNDRVYINVVVKNKEYRLATNQSQAQVEK  
ILSALEIPDVGNLSQVVVMKSKNDQGITNKCKMNLQDNNGNDIGFIGFHQFNNI AKLV  
ASNWYNRQIERSSRTLGC SWEFIPVDDGWGERPL"

misc feature 4042..4087  
/note="dyad symmetry"  
misc feature 4104..4136  
/note="dyad symmetry"  
misc feature 4158..4188  
/note="dyad symmetry"

## ORIGIN

```
1 tcaaagtatt tgtatattatg gtcattttaa taattaataa ttttaattaat ttttaaatatt
61 ataagagggtg ttaaatatgc aatttggttaa taaacaattt aattataaag atcctgtaaa
121 tgggtgttgat attgcttata taaaaattcc aaatgtagga caaatgcaac cagtaaaagc
181 ttttaaaatt cataataaaa tatgggttat tccagaaaga gatacattta caaatcctga
241 agaaggagat ttaaattccac caccagaagc aaaacaagtt ccagtttcat attatgattc
301 aacatattta agtacagata atgaaaaaga taattattta aaggaggatg caaaattatt
361 tgagagaatt tattcaactg atcttggaag aatgttggtta acatcaatag taaggggaat
421 accattttgg ggtggaagta caatagatag agaattaaaa gttattgata ctaattgtat
481 taatgtgata caaccagatg gtagttatag atcagaagaa cttaatctag taataatagg
541 accctcagct gatattatac agtttgtaag taaaagcttt ggacatgaag ttttgaatct
601 tacgcgaaat ggttatggct ctactcaata cattagattt agcccagatt ttacatttgg
661 ttttgaggag tcacttgaag ttgatacaaa tcctctttta ggtgcaggca aatttgctac
721 agatccagca gtaacattag cacatgaact tatacatgct ggacatagat tatatggaat
781 agcaattaat ccaaattagg tttttaaagt aaataactaat gcctattatg aaatgagtgg
841 gtagaagta agctttgagg aacttagaac atttggggga catgatgcaa agtttataga
901 tagtttacag gaaaacgaat ttcgtctata ttattataat aagtttaag atatagcaag
961 taaacttaat aaagctaaat caatagtagg tactactgct tcattacagt atatgaaaaa
1021 tgtttttaaa gagaaatatc tcctatctga agatacatct ggaaaatttt cggtagataa
1081 attaaaattt gataagttat acaaaatggt aacagagatt tacacagagg ataattttgt
1141 taagtttttt aaagtactta acagaaaaac atatttgaat tttgataaag ccgtatttaa
1201 gataaatata gtacctaagg taaattacac aatatatgat ggatttaatt taagaaatac
1261 aaatttagca gcaaacttta atggtcaaaa tacagaaatt aataatatga attttactaa
1321 actaaaaaat tttactggat tgtttgaatt ttataagttg ctatgtgtaa gagggataat
1381 aacttctaaa actaaatcat tagataaagg atacaataag gcattaaatg atttatgtat
1441 caaagttaat aattgggact tgttttttag tccttcagaa gataatttta ctaatgatct
1501 aaataaagga gaagaaatta catctgatac taatatagaa gcagcagaag aaaatattag
1561 tttagattta atacaacaat attatttaac cttaattttt gataatgaac ctgaaaatat
1621 ttcaatagaa aatctttcaa gtgacattat aggccaatta gaacttatgc ctaatataga
```

## BEST AVAILABLE COPY

1681 aagatttcct aatggaaaaa agtatgagtt agataaatat actatgttcc attatcttcg  
1741 tgctcaagaa tttgaacatg gtaaatctag gattgcttta acaaattctg ttaacgaagc  
1801 attattaaat cctagtcgtg tttatacatt tttttcttca gactatgtaa agaaagttaa  
1861 taaagctacg gaggcagcta tgttttttagg ctgggtagaa caattagtat atgattttac  
1921 cgatgaaact agcgaagtaa gtactacgga taaaattgcg gatataacta taattattcc  
1981 atatatagga cctgctttta atatatagtaa tatgtttatat aaagatgatt ttgtagggtc  
2041 tttaatatatt tcaggagctg ttattctgtt agaatttata ccagagattg caatacctgt  
2101 attaggtact tttgcacttg tatcatatat tgccaataag gttctaaccg ttcaaacaat  
2161 agataatgct ttaagtaaaa gaaatgaaaa atgggatgag gtctataaat atatagtaac  
2221 aaattgggta gcaaagggtta atacacagat tgatctaata agaaaaaaaa tgaaagaagc  
2281 tttagaaaat caagcagaag caacaaaggc tataataaac tatcagtata atcaatatac  
2341 tgaggaagag aaaaataata ttaattttta tattgatgat ttaagttcga aacttaatga  
2401 gtctataaat aaagctatga ttaatatata taaatttttg aatcaatgct ctgtttcata  
2461 tttaatgaat tctatgatcc cttatggtgt taaacgggta gaagattttg atgctagtct  
2521 taaagatgca ttattaaagt atatatatga taatagagga actttaattg gtcaagtaga  
2581 tagattaaaa gataaagtta ataatacact tagtacagat ataccttttc agctttccaa  
2641 atacgtagat aatcaaagat tattatctac atttactgaa tatattaaga atattattaa  
2701 tacttctata ttgaatttaa gatatgaaag taatcattta atagacttat ctagggtatgc  
2761 atcaaaaata aatattggta gtaaagtaaa ttttgatcca atagataaaa atcaaattca  
2821 attatttaaat ttagaaaagta gtaaaattga ggtaatttta aaaaatgcta ttgtatataa  
2881 tagtatgtat gaaaatttta gtactagctt ttggataaga attcctaagt attttaacag  
2941 tataagctca aataatgaat atacaataat aaattgtatg gaaaataatt caggatggaa  
3001 agtatcactt aattatggtg aaataatctg gactttacag gatactcagg aaataaaaca  
3061 aagagtagtt tttaaataca gtcaaagat taatatatca gattatataa acagatggat  
3121 ttttgtaact atcactaata atagattaaa taactctaaa atttatataa atggaagatt  
3181 aatagatcaa aaaccaattt caaatttagg taatattcat gctagtaata atataatggt  
3241 taaattagat ggttgtagag atacacatag atatatattg ataaaaatatt ttaatctttt  
3301 tgataaggaa ttaaatgaaa aagaaatcaa agattttatat gataatcaat caaattcagg  
3361 tatttttaaaa gacttttggg gtgattattt acaatatgat aaaccatact atatgttaaa  
3421 tttatatgat ccaaataaat atgtcgaagt aaataatgta ggtattagag gttatatgta  
3481 tcttaaaggg cctagaggta gcgtaatgac tacaaacatt tatttaaat caagtttgta  
3541 taggggggaca aaatttatta taaaaaata tgcttctgga aataaagata atattgttag  
3601 aaataatgat cgtgtatata ttaatgtagt agttaaaaat aaagaatata ggttagctac  
3661 taatgcatca caggcaggcg tagaaaaaat actaagtgca ttagaaatac ctgatgtagg  
3721 aaatctaagt caagtagtag taatgaagtc aaaaaatgat caaggaataa caaataaatg  
3781 caaaatgaat ttacaagata ataatgggaa tgatataggc tttataggat ttcacagtt  
3841 taataatata gctaaactag tagcaagtaa ttggtataat agacaaatag aaagatctag  
3901 taggactttg ggttgctcat gggaatttat tcctgtagat gatggatggg gagaaaggcc  
3961 actgtaatta atctcaaact acatgagtct gtcaagaatt ttctgtaaac atccataaaa  
4021 attttaaaat taatatgttt aagaataact agatatgagt attgctatgc taatatctag  
4081 ttattttaat ttattcaata ttattacagt aagaaaaaat actattttta ttgtaaatatc  
4141 aagtttagtg gtatatctca taaatgatac aagatatcat tataatgatt ttgcaaatat  
4201 tagttttgaa taaatatatt tacagtattt ttgaaatgat aataattact tcaaattctt  
4261 tagtataatt ttttaatgtc ttaattttta ca

//

[Disclaimer](#) | [Write to the Help Desk](#)  
[NCBI](#) | [NLM](#) | [NIH](#)

Feb 9 2005 14:31:10

h cb hg e e e e fcg b ce e